GOVERNMENT OF INDIA
EARTH SCIENCES
LOK SABHA

UNSTARRED QUESTION NO:1969
ANSWERED ON:09.03.2016
Theories of Gravitation
Wanaga Shri Chintaman Navsha

Will the Minister of EARTH SCIENCES be pleased to state:

(a) whether the Government is aware that theories of gravitation have been proved recently;

(b) if so, the details thereof;

(c) whether scientists from India were also involved in this said achievement;

(d) if so, the details thereof and the steps taken/being taken by the Government to reward those scientists; and

(e) if not, the reasons therefor?

Answer

THE MINISTER FOR MINISTRY OF SCIENCE AND TECHNOLOGY AND
MINISTRY OF EARTH SCIENCES
(DR. HARSH VARDHAN)

(a) Yes Madam.

(b) On February 11, 2016, the international Laser Interferometer Gravitational Wave Observatory (LIGO) Science Collaboration announced the discovery of gravitational waves arising from the merger of two black holes that are 13 billion light years away by the two LIGOs operating in USA. The discovery provides the most crucial proof of Einstein's theory of gravitation proposed in 1915, by showing the existence of an effect that is predicted by Einstein's theory of gravitation, but not expected from earlier theories of the same.

While Einstein's theory of gravitation has indeed successfully matched up to many tests over the century, the experimental validation of gravitational waves is the fundamentally distinctive prediction of this theory relative to the Newton's theory of gravitation that it replaced. Newton's theory does not predict Gravitational waves at all and is in contradiction with that of the Einstein information cannot be transmitted at speeds exceeding that of light. Hence, this scientific milestone has been dubbed as the most significant scientific discovery of the world.

(c) Yes Madam.

(d) A significant presence of Indian scientists exists in this milestone scientific achievement. India can also boast of three decades of research pursued at Inter-University Centre for Astronomy & Astrophysics (IUCAA), Pune and Raman Research Institute (RRI), Bengaluru at the frontiers of theory and signal extraction algorithm in the quest for discovering gravitational waves. Some of these accomplishments from India have directly contributed to the detection and are prominently cited in the discovery publication. In all, there are 37 authors from 9 Indian Institutions in the scientific article that presented the world with the first discovery of Gravitational Waves published in the Physical Review Letters by the LIGO Scientific Collaboration and Virgo Collaboration. The following Indian Institutions have participated in the global invention efforts:

S. No. Name of the Institution No. Scientists Engaged
1 Chennai Mathematical Institute (CMI), Chennai 2
2 International Centre for Theoretical Sciences- Tata Institute of Fundamental Research (ICTS-TIFR), Bengalure 7
3 Indian Institute of Science Education & Research (IISER), Kolkata 2
4 Indian Institute of Science Education & Research (IISER), Thiruvananthapuram 3
5 Indian Institute of Technology (IIT), Gandhinagar 2
6 Institute of Plasma Research (IPR), Gandhinagar 3
7 Inter-University Centre for Astronomy & Astrophysics (IUCAA), Pune 9
8 Raja Ramanna Centre for Advanced Technoloyg (RRCAT), Indore 6
9 Tata Institute of Fundamental Research (TIFR), Mumbai 3

Days after the above discovery announcement, the Union Cabinet had in principle approved a proposal to establish a gravitational wave detector in India as a reward to the Indian group of scientists who were part of global discovery. Known as the LIGO-India project, it is expected to be jointly piloted by the Department of Atomic Energy (DAE) and the Department of Science and Technology (DST).

(e) Does not arise.